

<p>93-213788/26 A96 B05 D21 E19 PROC 91.12.11 PROCTER & GAMBLE CO *WO 9311754-A1 91.12.11 91US-805432 (93.06.24) A61K 9/50, 7/16 Microcapsules for reducing oral bacteria and providing breath protection - comprise shell material and core compsn. contg. breath protection agent and antimicrobial e.g. quat. ammonium salt, copper salt, zinc salt or triclosan (Eng) C93-094791 N(CA F I NO) R(AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE) Addnl. Data: HUNTER M A, STAPLER J H 92.12.07 92WO-US10500</p>	<p>A(12-V4B, 12-W5) B(4-C3B, 5-A3A, 7-D4A, 10-A22, 12-A1, 12-L3, 12-M11E) D(8-B8) E(5-L3, 7-D4A, 10-A22)</p> <p>cause loss of the contents prematurely, or the actives may not be easily solubilised in the materials usually present in the core.</p> <p>PREFERRED MICROCAPSULES The shell material is polyvinyl alcohol, gelatin, waxes, gums or sugar candies. The microcapsules are in the form of a sphere, oblong, disk, a puffed square, or a cylinder and the breath control agent is a quat. ammonium salt (e.g. cetyl pyridinium chloride) and/or domiphen bromide. The microcapsules are 2-9mm in dia. and the shell wall thickness is 30 μ - 2 mm.</p> <p>EXAMPLE Microcapsules were prep'd. by mixing the following components (wt.%) of the core in one container and the components of them in another container: gelatin (12.578), sorbitol soln. (70% aq.; 2.046), saccharin (0.372), FD and C Blue #1 (0.002), FD and C yellow #5 (0.002) Captex 300 (a triglyceride; 72.140), flavour (12.750), cetyl pyridinium chloride (0.100) and domiphen bromide (0.010). WO9311754-A+</p>
<p>Microcapsules suitable for reducing oral bacteria and providing breath protection comprise a shell material suitable for use in the mouth and ingesting and a core compsn. comprising a breath protection agent antimicrobial selected from quat. ammonium salts, other cationic salts, copper salts, zinc salts, and/or triclosan, and an organic diluent.</p> <p>ADVANTAGE The microcapsules reduce oral bacteria and provide long lasting breath protection. The microcapsules do not have the problems associated with microcapsules of the prior art, e.g. the wall of the microcapsules may develop imperfections and</p>	

<p>The shell materials were heated to provide a fluid medium. The core and shell materials were then pumped separately to a two-fluid nozzle submerged in an organic carrier medium. The capsules formed were cooled and became stiff. They were then denatured and separated for further handling. (12pp2237JMDwgNo0/0). SR:1.Jnl.Ref EP485616 US5043154 WO8100205 WO9015592</p>	<p>WO9311754-A</p>
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Principal differences

- Microcapsules → dimension μ m → mm
- System needs to be retained in the mouth voluntarily to provide release
- Not applicable to Art applications lacking in this voluntary action.

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3/39/1

DIALOG(R)File 345:Inpadoc/Fam.& Legal Stat
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11233141

Basic Patent (No,Kind,Date): WO 9311754 A1 930624 <No. of Patents: 009>

Patent Family:

Patent No	Kind	Date	Applic No	Kind	Date
EP 616526	A1	940928	EP 93900886	A	921207
FI 9402765	A	940610	FI 942765	A	940610
FI 9402765	A0	940610	FI 942765	A	940610
NO 9402170	A	940610	NO 942170	A	940610
NO 9402170	A0	940610	NO 942170	A	940610
TR 27527	A	950607	TR 1174	A	921209
US 5286496	A	940215	US 3080	A	930111
US 5382424	A	950117	US 150663	A	931110
WO 9311754	A1	930624	WO 92US10500	A	921207 (BASIC)

Priority Data (No,Kind,Date):

WO 92US10500 W 921207
US 805432 A 911211
US 805432 B2 911211
US 150663 A 931110
US 805432 B1 911211

PATENT FAMILY:

EUROPEAN PATENT OFFICE (EP)

Patent (No,Kind,Date): EP 616526 A1 940928

CETYLPIRIDINIUM CHLORIDE AND DOMIPHEN BROMIDE IN ORGANIC SOLVENT.
(English; French; German)

Patent Assignee: PROCTER & GAMBLE (US)

Author (Inventor): HUNTER MARY ANN (US); STAPLER JUDITH HILL (US)

Priority (No,Kind,Date): WO 92US10500 W 921207; US 805432 A 911211

Applic (No,Kind,Date): EP 93900886 A 921207

Designated States: (National) AT; BE; CH; DE; DK; ES; FR; GB; GR; IE; IT; LI; LU; NL; PT; SE

IPC: * A61K-009/50; A61K-007/16

CA Abstract No: * 119(08)079866U; 120(16)200201Z

Derwent WPI Acc No: * C 93-213788; C 94-057206

Language of Document: English

EUROPEAN PATENT OFFICE (EP)

Legal Status (No,Type,Date,Code,Text):

EP 616526	P	911211	EP AA	PRIORITY (PATENT APPLICATION) (PRIORITAET (PATENTANMELDUNG))
EP 616526	P	921207	US 805432 A 911211	
EP 616526	P	921207	EP AA	PCT-APPLICATION (PCT-ANMELDUNG)
EP 616526	P	921207	WO 92US10500 W 921207	
EP 616526	P	921207	EP AE	EP-APPLICATION (EUROPAEISCHE ANMELDUNG)
EP 616526	P	940928	EP 93900886 A 921207	
EP 616526	P	940928	EP AK	DESIGNATED CONTRACTING STATES IN AN APPLICATION WITH SEARCH REPORT (IN EINER ANMELDUNG BENANNTE VERTRAGSSTAATEN)
EP 616526	P	940928	AT BE CH DE DK ES FR GB GR IE IT LI LU NL PT SE	
EP 616526	P	940928	EP A1	PUBLICATION OF APPLICATION WITH SEARCH REPORT (VEROEFFENTLICHUNG DER ANMELDUNG MIT RECHERCHENBERICHT)
EP 616526	P	940928	EP 17P	REQUEST FOR EXAMINATION FILED

clare

(PRUEFUNGSANTRAG GESTELLT)
940616
EP 616526 P 950329 EP 17Q FIRST EXAMINATION REPORT
(ERSTER PRUEFUNGSBESCHEID)
950214
EP 616526 P 970730 EP 18R REFUSED (ZURUECKGEWIESEN)
970316

FINLAND (FI)

Patent (No,Kind,Date): FI 9402765 A 940610
CETYLPIRIDINIUMKLORID OCH DOMIFENBROMID I ETT ORGANISKT LOESNINGSMEDEL
(Swedish)
Patent Assignee: PROCTER & GAMBLE (US)
Author (Inventor): HUNTER MARY ANN (US); STAPLER JUDITH HILL (US)
Priority (No,Kind,Date): WO 92US10500 W 921207; US 805432 A
911211
Applic (No,Kind,Date): FI 942765 A 940610
IPC: * A61K
CA Abstract No: * 119(08)079866U; 120(16)200201Z
Derwent WPI Acc No: * C 93-213788; C 94-057206
Language of Document: Finnish; Swedish
Patent (No,Kind,Date): FI 9402765 A0 940610
CETYLPIRIDINIUMKLORID OCH DOMIFENBROMID I ETT ORGANISKT LOESNINGSMEDEL
(Swedish)
Patent Assignee: PROCTER & GAMBLE (US)
Author (Inventor): HUNTER MARY ANN (US); STAPLER JUDITH HILL (US)
Priority (No,Kind,Date): WO 92US10500 W 921207; US 805432 A
911211
Applic (No,Kind,Date): FI 942765 A 940610
IPC: * A61K
CA Abstract No: * 119(08)079866U; 120(16)200201Z
Derwent WPI Acc No: * C 93-213788; C 94-057206
Language of Document: Finnish; Swedish

FINLAND (FI)

Legal Status (No,Type,Date,Code,Text):
FI 942765 A 980630 FI FD Application shelved (J tetty
sillens 4 kk)

NORWAY (NO)

Patent (No,Kind,Date): NO 9402170 A 940610
Priority (No,Kind,Date): US 805432 A 911211; WO 92US10500 W
921207
Applic (No,Kind,Date): NO 942170 A 940610
IPC: * A61K-009/50; A61K-031/44; A61K-031/14; A61K-007/16
CA Abstract No: * 119(08)079866U; 120(16)200201Z
Derwent WPI Acc No: * C 93-213788; C 94-057206
Language of Document: Norwegian
Patent (No,Kind,Date): NO 9402170 A0 940610
CETYLPIRIDINIUMKLORID OG DOMIFENBROMID I ORGANISK LOESNINGSMIDDEL
(Norwegian)
Patent Assignee: PROCTER & GAMBLE (US)
Author (Inventor): HUNTER MARY ANN (US); STAPLER JUDITH HILL (US)
Priority (No,Kind,Date): US 805432 A 911211; WO 92US10500 W
921207
Applic (No,Kind,Date): NO 942170 A 940610
IPC: * A61K-009/50; A61K-031/44; A61K-031/14; A61K-007/16
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Language of Document: Norwegian

TURKEY (TR)

Patent (No,Kind,Date): TR 27527 A 950607
NEFES KORUYUCU MIKROKAPSUELLER (Turkish)

clare

Patent Assignee: PROCTER & GAMBLE (US)
Priority (No,Kind,Date): US 805432 A 911211
Applic (No,Kind,Date): TR 1174 A 921209
IPC: * A61K-007/16; A61K-007/00
CA Abstract No: * 119(08)079866U; 120(16)200201Z
Derwent WPI Acc No: * C 93-213788; C 94-057206
Language of Document: Turkish

UNITED STATES OF AMERICA (US)

Patent (No,Kind,Date): US 5286496 A 940215
BREATH PROTECTION MICROCAPSULES (English)
Patent Assignee: PROCTER & GAMBLE (US)
Author (Inventor): STAPLER JUDITH H (US); HUNTER MARY ANN (US)
Priority (No,Kind,Date): US 805432 B2 911211
Applic (No,Kind,Date): US 3080 A 930111
National Class: * 424490000; 424048000; 424049000; 424058000;
424435000; 424440000; 424492000; 514948000; 514963000
IPC: * A61K-009/50; A61K-009/16; A61K-009/68
CA Abstract No: ; 120(16)200201Z
Derwent WPI Acc No: ; C 94-057206
Language of Document: English
Patent (No,Kind,Date): US 5382424 A 950117
BREATH PROTECTION MICROCAPSULES (English)
Patent Assignee: PROCTER & GAMBLE (US)
Author (Inventor): STAPLER JUDITH H (US); HUNTER MARY A (US)
Priority (No,Kind,Date): US 150663 A 931110; US 805432 B1 911211
Applic (No,Kind,Date): US 150663 A 931110
National Class: * 424054000; 424049000; 424489000; 424492000
IPC: * A61K-007/16; A61K-007/22; A61K-009/50
CA Abstract No: * 119(08)079866U; 120(16)200201Z
Derwent WPI Acc No: * C 93-213788; C 94-057206
Language of Document: English

UNITED STATES OF AMERICA (US)

Legal Status (No,Type,Date,Code,Text):
US 5286496 P 911211 US AA PRIORITY
US 5286496 P 930111 US AE APPLICATION DATA (PATENT)
(APPL. DATA (PATENT))
US 3080 A 930111
US 5286496 P 930310 US AS02 ASSIGNMENT OF ASSIGNOR'S
INTEREST
PROCTER & GAMBLE COMPANY, THE ATTN: CHIEF
PATENT COUNSEL IVORYDALE TECHNICAL CEN ;
STAPLER, JUDITH HILL : 19930111; HUNTER, MARY
ANN : 19930111
US 5286496 P 940215 US A PATENT
US 5286496 P 980428 US FP EXPIRED DUE TO FAILURE TO PAY
MAINTENANCE FEE
980218
US 5382424 P 911211 US AA PRIORITY
US 5382424 P 931110 US AE APPLICATION DATA (PATENT)
(APPL. DATA (PATENT))
US 150663 A 931110
US 5382424 P 950117 US A PATENT
US 5382424 P 990330 US FP EXPIRED DUE TO FAILURE TO PAY
MAINTENANCE FEE
990117

WORLD INTELLECTUAL PROPERTY ORGANIZATION, PCT (WO)

Patent (No,Kind,Date): WO 9311754 A1 930624
CETYLPIRIDINIUM CHLORIDE AND DOMIPHEN BROMIDE IN ORGANIC SOLVENT

clare

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : A61K 9/50, 7/16	A1	(11) International Publication Number: WO 93/11754 (43) International Publication Date: 24 June 1993 (24.06.93)
(21) International Application Number: PCT/US92/10500 (22) International Filing Date: 7 December 1992 (07.12.92) (30) Priority data: 805,432 11 December 1991 (11.12.91) US (71) Applicant: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US). (72) Inventors: HUNTER, Mary, Ann ; 8368 Jadwin Street, Cincinnati, OH 45216 (US). STAPLER, Judith, Hill ; 1084 Brown Road, Wilmington, OH 45177 (US). (74) Agents: REED, David, T. et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45202 (US).		(81) Designated States: CA, FI, NO, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: CETYLPYRIDINIUM CHLORIDE AND DOMIPHEN BROMIDE IN ORGANIC SOLVENT (57) Abstract The present invention relates to oral compositions in the form of microcapsules which reduce oral bacteria and provide long lasting breath protection.		

(English)
 Patent Assignee: PROCTER & GAMBLE (US)
 Author (Inventor): HUNTER MARY ANN (US); STAPLER JUDITH HILL (US)
 Priority (No,Kind,Date): US 805432 A 911211
 Applic (No,Kind,Date): WO 92US10500 A 921207
 Designated States: (National) CA; FI; NO (Regional) AT; BE; CH; DE; DK; ES; FR; GB; GR; IE; IT; LU; MC; NL; PT; SE
 Filing Details: WO 130000 With international search report; Before expiration of time limit for amending the claims and to be republished in the event of the receipt of the amendments
 IPC: * A61K-009/50; A61K-007/16
 CA Abstract No: ; 119(08)079866U
 Derwent WPI Acc No: ; C 93-213788
 Language of Document: English

WORLD INTELLECTUAL PROPERTY ORGANIZATION, PCT (WO)

Legal Status (No,Type,Date,Code,Text):

WO 9311754	P	911211	WO AA	PRIORITY (PATENT)
			US 805432 A	911211
WO 9311754	P	921207	WO AE	APPLICATION DATA (APPL. DATA)
			WO 92US10500 A	921207
WO 9311754	P	930624	WO AK	DESIGNATED STATES CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT (DESIGNATED STATES CITED IN A PUBLISHED APPL. WITH SEARCH REPORT)
			CA FI NO	
WO 9311754	P	930624	WO AL	DESIGNATED COUNTRIES FOR REGIONAL PATENTS CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT (DESIGNATED COUNTRIES FOR REGIONAL PATENTS CITED IN A PUBLISHED APPL. WITH SEARCH REPORT)
			AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE	
WO 9311754	P	930624	WO A1	PUBLICATION OF THE INTERNATIONAL APPLICATION WITH THE INTERNATIONAL SEARCH REPORT (PUB. OF THE INTERNATIONAL APPL. WITH THE INTERNATIONAL SEARCH REPORT)
WO 9311754	P	930902	WO DFPE	REQUEST FOR PRELIMINARY EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH MONTH FROM PRIORITY DATE

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FI	Finland				

CETYLPYRIDINIUM CHLORIDE AND DOMIPHEN
BROMIDE IN ORGANIC SOLVENT

TECHNICAL FIELD

5 The present invention relates to oral compositions in the form of microcapsules which reduce oral bacteria and provide long lasting breath protection.

BACKGROUND OF THE INVENTION

10 The use of breath control compositions such as breath mints, mouthwashes, chewing gums, etc. is widespread in most of the developed countries of the world. Another form which has been used are microcapsules containing a flavorant or other breath protection agent. These executions have acceptance due not only to their usefulness away from a place to expectorate mouthwashes
15 but also due to the fact that they can be swallowed when the user does not need any more of the actives or doesn't want the microcapsule in the mouth any longer.

 Although microcapsules have been used, there are problems associated with incorporating certain breath protection agents/
20 antimicrobials into the core. Oftentimes the wall of the microcapsule may develop imperfections and cause loss of the contents prematurely. Additionally, the actives may not be easily solubilized in the materials usually present in the core.

 The prior art discloses a variety of means for providing
25 breath protection and reducing oral bacteria. Included among such means are sprays disclosed in U.S. 3,431,208, March 4, 1969 to Bailey. Particles containing an adhesive member are disclosed in U.S. 3,911,099, October 7, 1975 to Den Foney et al. Another form is a mouthwash concentrate in a unit dosage cup as disclosed in
30 U.S. 4,312,889, January 26, 1982 to Melsheimer. All of these references are incorporated herein by reference.

 The present inventors have found that by incorporating the breath control/antimicrobial actives into the core of the microcapsule along with organic diluents, problems associated with
35 other microcapsule executions can be avoided.

It is therefore an object of the present invention to provide improved microcapsules.

It is another object of the present invention to provide microcapsules which provide improved breath control and reduce oral bacteria.

It is still another object of the present invention to provide improved methods of providing breath control and reducing oral bacteria.

These and other objects will become more apparent from the detailed description which follows.

All percentages and ratios used herein are by weight unless otherwise specified. Additionally, all measurements are made at 25°C unless otherwise specified.

SUMMARY OF THE INVENTION

The present invention in one of its aspects relates to microcapsules which contain breath control actives/antimicrobials in the core of the microcapsule along with an organic diluent.

DETAILED DESCRIPTION OF THE INVENTION

The essential as well as optional components of the capsules of the present invention are described in the following paragraphs.

Capsule Shell Material:

The shell material of the microcapsules of the present invention can be any materials which are suitable for ingestion as well as retention in the oral cavity. Materials which are suitable include gelatin, polyvinyl alcohols, waxes, gums and sugar candy type materials used in cough drops and mints, for example.

The shell material is used to form any of a wide variety of shapes such as spheres, oblong shapes, disks, puffed squares and cylinders. The shell thickness is preferably in the range of about 30um to about 2mm, preferably from about 70um to about 110um. If the microcapsules are spherical, the particle diameter is generally in the range of from about 2mm to about 9mm, preferably from about 3mm to about 7mm.

Breath Control Agents/Antimicrobials Present in the Core:

The breath control agents used in the cores of the microcapsules include quaternary ammonium salts such as pyridinium salts (e.g., cetyl pyridinium chloride), domiphen bromide, other cationic materials such as chlorhexidine salts, zinc salts and copper salts. Other organic agents such as triclosan and other noncationic water insoluble agents are also useful herein. Such materials are disclosed in U.S. Patent 5,043,154, August 27, 1991, incorporated by reference herein.

These breath control/antimicrobial agents are used in an amount of from about 0.001% to about 2%, preferably from about 0.005% to about 1% of the total core contents.

Diluents for Use in Microcapsule Core:

The solubilizing agent for the breath control/antimicrobial agents used in the cores of the present microcapsules can be any of a number of materials. Preferred are oils such as corn, olive, rapeseed, sesame, peanut or sunflower. Other preferred materials are triglycerides such as Captex 300. These are used in an amount of from about 20% to about 80%, preferably from about 65% to about 70% of the total capsule weight.

Additional Agents Suitable for Use in the Core of Capsule:

The core of the microcapsules of this invention may contain any number of additional materials to provide additional efficacy and/or sensory perceptions. Such agents may include flavoring agents such as thymol, eucalyptol, menthol, methyl salicylate or witch hazel. These agents are used in an amount of from about .1% to about 25%, preferably from about 10% to about 15% of the total capsule weight.

In addition, a variety of sweetening agents such as sugars, corn syrups, saccharin or aspartame may also be included in the core. These agents are used in an amount of from about .1% to about 5%, preferably from about .35% to about .5% of the total capsule weight.

Method of Manufacture:

The capsules of the present invention can be made using a variety of techniques. One method is described after the following examples.

Industrial Applicability:

The capsules of the present invention are used by placing the capsules into the mouth and retaining them therein for a period sufficient to provide the desired effect.

5 The following examples further describe and demonstrate preferred embodiments within the scope of the present invention. The examples are given solely for the purposes of illustration and are not to be construed as illustrative of limitations of this invention. Many variations thereof are possible without departing
10 from the invention's spirit and scope.

EXAMPLES 1-4

The following compositions/capsules are representative of the present invention.

<u>Component</u>	<u>Weight %</u>			
Gelatin	12.578	12.328	12.578	17.578
Sorbitol Solution (70% Aqueous)	2.046	2.05	2.046	2.046
Saccharin	0.372	0.500	0.372	0.450
FD&C Blue #1	0.002	0.002	0.002	-
FD&C Yellow #5	0.002	-	0.002	0.004
Captex 300 ¹	72.140	70.00	71.925	66.142
Flavor	12.750	15.00	12.75	13.500
Cetyl Pyridinium Chloride	0.100	-	-	-
Domiphen Bromide	0.010	-	-	-
Chlorhexidine	-	0.12	-	-
ZnCl ₂	-	-	0.025	-
Sodium Lauryl Sulfate	-	-	0.300	-
Triclosan	-	-	-	0.28

1) Captex 300 is a triglyceride supplied by Capitol City Product, Columbus, Ohio.

35 The above compositions are prepared by mixing the components of the core in one container and the components of the shell in another container. The shell materials are heated to provide a fluid medium. The core and shell materials are then pumped

separately to a two-fluid nozzle submerged in an organic carrier medium. The capsules formed are allowed to cool and stiffen. They are then denatured and separated for further handling.

In the above compositions any of a wide variety of other shell materials, breath control agents, sweeteners as well as other components may be used in place of or in combination with the components listed above.

WHAT IS CLAIMED IS:

1. Microcapsules suitable for reducing oral bacteria and providing breath protection comprising a shell material suitable for use in the mouth and ingesting and a core composition comprising a breath protection agent/anti-microbial selected from the group consisting of quaternary ammonium salts, other cationic salts, copper salts, zinc salts, triclosan and mixtures thereof and an organic diluent.
2. Microcapsules according to Claim 1 wherein the shell material is selected from the group consisting of polyvinyl alcohol, gelatin, waxes, gums and sugar candies.
3. Microcapsules according to either of Claims 1 or 2 wherein the microcapsule is in the form of a sphere, oblong, disk, a puffed square, or a cylinder and the breath control agent is a quaternary ammonium salt.
4. Microcapsules according to any of Claims 1-3 wherein the microcapsules are in the form of spheres.
5. Microcapsules according to Claim 4 wherein the microcapsules are from about 2mm to about 9mm in diameter and the shell wall thickness is from about 30um to about 2mm.
6. Microcapsules according to any of Claims 1-5 wherein the shell material is gelatin.
7. Use of a breath protection agent/antibacterial in the manufacture of microcapsules for reducing oral bacteria and breath odor in the mouth wherein the microcapsules comprise a shell material suitable for use in the mouth and ingesting and a core composition comprising a breath protection

agent/antimicrobial selected from the group consisting of quaternary ammonium salts, other cationic salts, copper salts, zinc salts, triclosan and mixtures thereof and an organic diluent.

8. A manufacture according to Claim 7 wherein the microcapsule shell is made of gelatin.
9. A manufacture according to either of Claims 7 or 8 wherein the breath control/antimicrobial active is selected from the group consisting of cetyl pyridinium chloride, domiphen bromide and mixtures thereof.
10. A method according to any of Claims 7-9 wherein the microcapsule is in the form of a sphere.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 92/10500

A. CLASSIFICATION OF SUBJECT MATTER

IPC5: A61K 9/50, A61K 7/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DIALOG: WPI, WPIL, CLAIMS, MEDLINE, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO, A1, 8100205 (ARTHUR BARR), 5 February 1981 (05.02.81) ---	1-10
Y	WO, A1, 9015592 (PATRICK JOHN SHANAHAN), 27 December 1990 (27.12.90) ---	1-10
Y	EP, A1, 0485616 (SUNSTAR KABUSHIKI KAISHA), 20 May 1992 (20.05.92), see page 2 lines 1-40 ---	1-10

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 92/10500

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